E-Municipalities in Western Canada

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I. Introduction

The communications revolution has had an enormous impact on Canadian society and business, and there are reasons to believe that this revolution will extend to governments. Canadians are heavy users of information and communication technologies (ICTs); Canadian Internet usage rates are the highest in the world (Gignac, 2000), with 53% of Canadians over the age of 15 currently online (Dryburgh, 2001: 1). In addition, Canadians are at the forefront of using these new technologies to interact with governments, out-ranking the United States by 12% (Gignac, 2000), and a 2000 survey suggests that nearly half of Canadian Internet-users (44%) access government services online (PricewaterhouseCoopers, 2000: 34).

The potential for ICTs to revolutionize governments appears great: ICTs offer governments inventive new ways to interact with citizens, to make information and services more readily available, and to make governments themselves more accountable. Initiatives are taking place worldwide, and the dominant tone is one of optimism and promise. However, this optimism is tempered with a growing caution: it is not yet clear that ICTs will live up to this promise of renewed democracy and citizen-centered activity (Hanselmann, 2001).

What is the state of e-government in Canada? This study explores that question by looking at municipal efforts at e-government in western Canada. The reason for this local focus is simple: despite the promise of instantaneous global communication and interaction, local issues and services remain central to the lives of Canadians. Municipalities are important providers of transit, utilities, community programs and other services, and they provide the infrastructure that supports vital sectors of the Canadian economy. Development of e-government in municipal contexts can have important impacts in a wide variety of areas, ranging from traditional municipal concerns to broader areas of services and economic development.

Three methods were used to examine the state of municipal e-government in western Canada: an environmental scan of the seven major western cities, interviews with key individuals, including officials working with municipal websites and experts in the field, and an online survey of all western Canadian municipalities with populations greater than 1,000.[1] In total, 478 surveys were sent and 196 (41%) completed. In organizing this research, a distinction was made between static (information-based) and active (transaction-based) features (Spearman, Welch and Associates, 2000). It should be noted that websites can change quickly, and sites may have been updated since the research was completed in May 2001.

What is e-government?

The Riley Report provides a useful definition: "E-governance is the movement of governments online to electronically deliver their services and programs, provide government information, and interact with the citizen" (Riley, 2001). A note of optimistic promise remains prominent: "combined with greater openness, e-government could transform people's involvement in government processes" (Heath, 2000: 39). But, the meaning of the term has not yet stabilized. At this point, e-government remains possibility more than reality.

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1. Thanks are extended to Jacquie Skailes, Web Business Consultant for the City of Calgary, for her helpful comments on the survey design.

II. E-Government: Current Usage

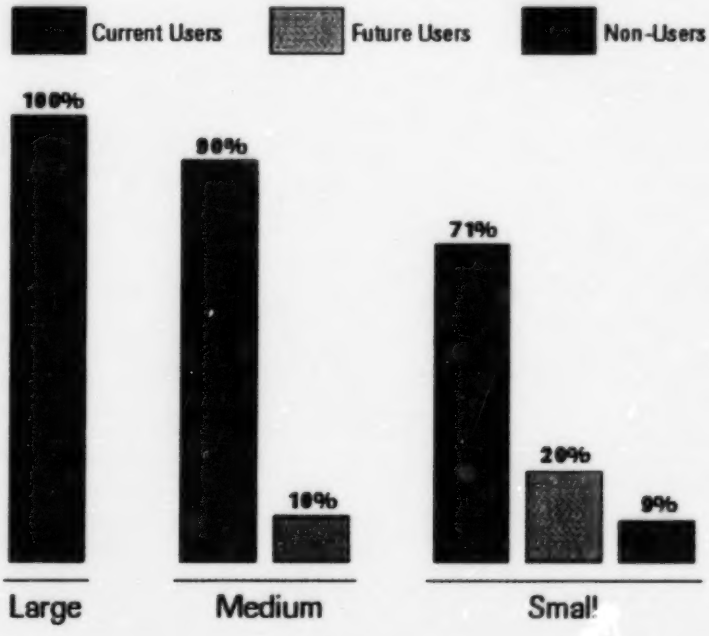
ICTs are quickly becoming a standard component of western Canada municipalities' offerings to the public regardless of municipality size (see Figure 1). Almost eight in ten (77.6%) of the municipalities surveyed currently have an online presence ("current users"), while another 16.3% intend to establish a web presence within two years ("future users"). Only 6.1% of responding municipalities are not planning to go online within two years ("non-users"), and all of these municipalities have populations under 10,000.

Municipalities go online primarily to provide information to the public (96.7%) and to promote economic development (75.7%). Less than one in four municipalities with websites (22.4%) cited citizen demand as a reason for establishing the site. For non-users, the primary reasons cited are lack of expertise and the relative importance of other spending priorities.

Municipalities go online primarily to provide information to the public and to promote economic development.

Figure 1:

E-Government Among Large, Medium and Small Municipalities



Large Municipalities - over 100,000 population (n=12); Medium Municipalities - 10,000-99,999 population (n=48); Small Municipalities - under 10,000 population (n=136)

There appears to be a pattern in the development of municipal websites. Sites typically begin with community and economic development information, including information on parks, recreation, and business development (including regional tourist information), and links to community organizations and libraries. Sites then move on to incorporate information on city government and services, such as service delivery, bylaws, council deliberations, elections and budgets. After developing the information side of the websites, municipalities begin to experiment with e-services. The development of community interaction tools appears to be the last stage of municipal e-government. Municipalities in the planning stages indicate that they have similar priorities. While this pattern of municipal e-government development appears to reflect current realities, it will most likely change over time with technological advances and shifting citizen demand.

At this point, western Canadian municipal websites are largely information-based. That is, they offer a wide variety of predominantly text-based information but little in the way of online services or other interactive features. Currently, websites are used primarily to promote tourism and business development and to strengthen community ties. Not surprisingly, the level and variety of information on municipal websites varies with municipal size, with large municipalities providing the greatest range of information. Larger municipalities are beginning to develop a limited number of e-services, but currently few e-services exist. With the exception of some website survey features, western Canadian municipal websites do not have many features for citizen interaction.

When asked why their municipality created a website, some survey respondents reported that the main purpose of the website is to strengthen community ties:

"Community focus."

"To promote a sense of community."

"To be a focus point to the community."

"To bring the community closer by highlighting local activities."

III. Online Information: Static Web Features

As the survey indicated, most municipalities go online for the purposes of economic development and providing information for citizens. It is therefore not surprising that these informational aspects are the most developed on municipal websites (see Figure 2). The environmental scan indicates that websites are also using images, photo galleries, and "fun" features to attempt to "brand" and promote the municipalities; for example, the Cities of Regina and Victoria give virtual visitors an opportunity to send cyber postcards. The issue of branding is interesting to note, as many municipal websites provide information only on the municipality itself, and do not provide information about the surrounding region. One exception to this is the City of Vancouver site, which offers especially strong resources on both community and regional issues. There are video clips on a wide range of topics, including multicultural, community, and regional issues. The site also includes videos on regional governance and history, "tips to make a better region," and links to a regional website.

After developing community and economic development information, municipal websites generally turn to providing online information about municipal government and municipal elections. This is

Figure 2:

Community, Economic Development and Tourist Information Availability

	Large Municipalities (n=12)	Medium Municipalities (n=43)	Small Municipalities (n=97)
Links to Community Organizations	92%	88%	69%
Parks and Recreation	92%	86%	66%
Links to the Library	92%	70%	30%
Employment/Volunteer Information	83%	67%	24%
Public/Current Events	83%	79%	45%
Contact Information	100%	93%	92%
Statistics/Demographics	83%	84%	56%
Tourist Information	75%	88%	75%
Business Development	67%	72%	57%
City Maps	67%	54%	37%

According to respondents, providing tourist information is an important function of the websites:

"We receive very positive comments from all over the world. We believe most people who use it are out of the area and, therefore, it benefits tourism."

"We receive positive feedback on a regular basis. It has generated lots of tourist traffic from Europe."

"It has given information on a number of little known potential tourism hotspots in Alberta and directions on how to get there. It has also given some exposure to our small businesses in the county as well."

currently an area of expansion for municipal websites, and information on service payments, council deliberations, budgets, bylaws, and elections will have a greater online presence in the future. For example, although few websites currently have information about service payments, three-quarters of the large municipalities plan to add this information within two years. Information on budgets and bylaws is another area that is currently being developed. Larger municipalities are further ahead, but smaller and medium sized municipalities have plans to provide this sort of information. The environmental scan of the larger municipalities revealed variations in the online accessibility and prominence of government information. The Edmonton, Regina and Vancouver websites stood out in having links to service information prominently situated on their main pages. While many of the large cities have some form of information regarding agendas or deliberations of municipal committees, the City of Saskatoon goes further by allowing citizens to subscribe to email notification regarding press releases and the availability of council minutes.

Another interesting feature is election pages that give information on how and when to vote, and on candidate profiles. Larger municipalities are already offering more election-related material online. For example, the City of Winnipeg's site includes a description of the optical scanning procedure used to count votes, and information on polling wards. Although smaller municipalities are still quite far behind, about half have plans to include election information on their websites.

Figure 3:

Municipal Government and Election Information Availability

	Large Municipalities (n=12)	Medium Municipalities (n=43)	Small Municipalities (n=97)
Bylaws	92%	65%	20%
City Planning	83%	67%	28%
Budgets	67%	56%	19%
Council Deliberations	67%	70%	33%
Emergency Preparedness	67%	58%	19%
Environmental Information	67%	42%	23%
Transit	58%	37%	10%
Service Payment Information	17%	35%	9%
Election Press Release	75%	52%	8%
Election Results	75%	58%	7%
How to Vote	58%	42%	5%
Voting Locations and Times	50%	51%	5%
Voter Eligibility	50%	42%	4%
Candidate Qualifications	33%	28%	2%
Sample Ballots	17%	12%	0%

IV. E-Services: Transactional Web Features

Providing e-services is one of the most attractive features of e-government. Citizens are demanding that services – such as registration for programs, utility payments, property tax payments, and permit applications – be made accessible at any hour by telephone or website (Caldow, 2001a: 7-9). There have been numerous American examples of e-services, with some impressive results. There is an emerging consensus among American mayors that "e-cities are becoming the key to prosperity and economic growth" (Harris, 2000). Phoenix has a website that offers web-based services and transactions at lower rates than other modes of delivery by collaborating with industry ("The Next Revolution", 2000). Other American cities currently offering e-services include Dallas, Seattle, Chicago, Boston and Atlanta (Kelly, 2000). However, not all e-services efforts in the US have been successful. For example, govWorks, a centralized e-services site designed to collect local fines, fees and taxes, has already been discontinued ("Sign on the Dot.com Line," 2000).

Providing e-services is one of the most attractive features of e-government.

"Our residents and customers now have immediate access to information that is pertinent to them. We have also saved significant dollars on advertising for new positions. Previously we put detailed information in several newspapers, which was costly. Now we only put in the job title, a brief description of the job, and direct the individual to go to the web page for more information. They can download application forms, and even submit their resumes through the web. We also post all tenders on the web and businesses can also view who the successful vendor was once the tender has been awarded. This cuts down on the number of phone calls that previously came to the purchasing department."

– Survey Respondent

There are also important international examples of innovative uses of ICTs at the municipal level. Singapore is considered to be one of the most advanced virtual cities, with probably the most extensive list of transaction-based services ("Island Site", 2000; cf. Mahizhnan Aru and Mui Teng Yap, 2000). The Knowsley Metropolitan Borough Council in Britain has a "Life Episodes" section that organizes services from birth to bereavement, with a link to this service placed prominently on their homepage. The site also promises to offer online chats with Knowsley Officers in the future.

In Canada, the federally-funded "Smart Communities" initiative has produced several examples of Canadian municipalities using new technologies in innovative ways (see Appendix). Independent of this program, other Canadian cities are setting valuable precedents. Mississauga, for example, hopes to be Canada's "premier e-city," with a well-organized site that focuses on information and service delivery (Barrett, 2000, 21). The City of Victoria's site is an acknowledged leader among Canadian municipal websites, and is the only Canadian municipal site to be listed as a model site in the U.S. Intergovernmental Advisory Board's global survey, Integrated Service Delivery. The City of Calgary has also begun to make interactive services readily available, and all are easily accessible from the main page in the "Doing Business with the City" section.

Western Canadian municipalities offer few e-services at present, but many are actively planning to do so. For example, visitors to Edmonton's site are informed that "e-commerce and e-business services" are being developed, including bill payments, program registration, document delivery, record searches, and other services. As online services emerge, certain modes of interactivity appear to predominate: filling out and submitting forms online (e.g., Calgary); downloading and printing brochures and forms for submission by traditional means (e.g., Edmonton and Regina); and e-mail service requests (e.g., Regina).

Although implementation depends to some extent on municipal size, large municipalities do not always set the pace. For example, with respect to implementation of online business permits and online utility payments, municipalities of all sizes have plans to implement these, but smaller and moderate sized municipalities report being further ahead in this area. In addition, over half of large municipalities (58%) are planning to provide online utility payments and applications for building permits in the future, though none actually do so at present. Yet, some smaller municipalities report already having these services. On Edmonton's website there are links to utility companies, some of which offer online account information and payment services. All sizes of municipalities have plans to implement a property tax assessment tool on their website. Winnipeg and Calgary currently offer this service online, and Victoria allows online requests for delivery by fax. Other services that are starting to appear online include pet registration (e.g., Calgary and Victoria) and online parking

Best Practices in E-Government: Seattle
(www.cityofseattle.net)

There seem to be two directions – service delivery and citizen interaction - that can be taken with e-government, and Seattle is a leader in both areas. Government Technology magazine and the Center for Digital Government named CityofSeattle.net "Best Local Government Web Site" in their sixth annual "Best of the Web" contest. The homepage of the site is organized in an easy-to-navigate manner, and the information provided is comprehensive. Online services and forms are available directly from the home page. Citizens may view sure stream video of council meetings and comment on them using online forms. There is also a link to a "hot topics" page. Citizens can e-mail the mayor, elected city officials, county, state and federal elected officials from the site. Surveys on a variety of topics are also available.

Transaction-based services available through the Seattle website allow residents to:

- *Pay fines and tickets online;*
- *Pay utilities through "automatic bank payment";*
- *Submit a consumer complaint form;*
- *Search online library catalogue and use an "Ask a Question Online" Form;*
- *Access and print various forms, including those for pet and program registration.*

"I really think web sites and e-services have been overrated. I do not think the public is anywhere near where the technocrats think they are so far as e-services are concerned. That's why the website has had very little impact."

– Survey Respondent

ticket payments (e.g., Vancouver and Victoria). Many large municipalities (64%) reported that they have plans to implement online registration for recreation programs. Online registration for recreational activities may be especially appealing because, as a non-mandatory service, it provides a good test of e-service provision. For example, the City of Calgary Parks and Recreation has an online registration form, and Vancouver citizens can submit picnic applications online.

At present, moderate-sized municipalities are not using e-services a great deal. However, they do have concrete plans to implement them in the future. Moderate-sized municipalities were most likely to indicate plans to provide business licenses and permits. For example, nearly three quarters expect to offer business permits online, and over half expect to have Geographic Information Systems, property tax assessment, and utility payments online. Nearly half expect to offer change of

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address notification, parking ticket payments, and pet registration. Small municipalities are much less likely to have plans to expand into e-services. For municipalities of all sizes, a variety of reasons are cited for the current scarcity of online service provision. Just over a quarter of survey respondents cited lack of citizen demand, lack of technical expertise, and other spending priorities, while fifteen percent stated that there was no need to offer these services.

Figure 4:
E-Services Availability

	Large Municipalities (n=12)	Medium Municipalities (n=43)	Small Municipalities (n=97)
Employment Application	50%	24%	6%
Geographic Information Systems	42%	7%	1%
Recreation Programs Registration	27%	14%	2%
Online Purchasing Tenders	25%	2%	1%
Property Tax Assessment/Payment	17%	19%	2%
Pet Registration	17%	0%	1%
Parking Ticket Payments	8%	3%	0%
Business Licenses/Permits	0%	7%	7%
Utility Payments	0%	5%	6%
Change of Address Notification	0%	2%	1%
Site Plan Approval	0%	2%	1%

A recent study, Citizen Expectations for Electronic Government Services, found that citizen expectations are more likely to be met when citizens are directly involved in plans for, and implementation of, e-government (Intergovernmental Advisory Board Federation of Government Information Processing Councils et al., 2000).

V. Citizen Engagement: Interactional Web Features

The implementation of e-government is partly driven by the expected value that it will have for citizens. In addition to allowing citizens to receive information and access services more quickly, e-government promises to help citizens become more involved in political decision-making. For example, Bruce Romer, the President of the International City/County Management Association (ICMA), suggests that e-government is "another way for local governments to deliver democracy to citizens" ("Joint ICMA/PTI News Conference," 2001). A related expectation is that e-government will be more accountable to citizens.

There are a number of ways that websites can be used as a tool for increased citizen engagement,

ranging from merely providing information about public meetings to the creation of online forums and consultation mechanisms. City of Toronto Councillor David Miller suggests that a gradual approach is best for fostering online participation: "first get people used to surveys, then move into forums, and then into online public meetings...people have to see that their feedback makes a difference" (Miller, 2001). Indeed, online surveys appear to be the mechanism most governments use to enter into online citizen engagement. Online surveys have been widely implemented, from simple opinion polls to more complicated surveys intended for specific audiences. The public is already responding to online surveys about specific issues that they have had the opportunity to become informed about on a given website.

"The city budget planning has been started already three times (1999, 2000 and 2001) with an online consultation completed with a paper form. For example, in this year's budget, there is about 50 million marks more money on those fields that the citizens considered most important according to this consultation."

– Jari Seppälä, Information Manager, City of Tampere, Finland

Online surveys leads naturally to questions about online voting; ICTs could provide a convenient way for citizens to easily vote on different issues, making populist ideas such as plebiscites and referenda more feasible. Although online voting does have important limitations related to accessibility, privacy and security, it has been used at the municipal level. Banff was the first western Canadian municipality to use computer-based voting ("Dollars from digital democracy," 1998: 22). There have been some international initiatives to begin electronic voting. Online voting was used in Phoenix for the Democratic primary election, producing a larger number of voters than usual ("Digital democracy" 2000). Estonia plans to have online voting by 2003 to help encourage participation in the next election (Left, 2001). Sweden plans to make electronic voting available by 2006 (Heath, 2000: 23). A combination of Internet, telephones, and electronic kiosks may help to make the process even more accessible to the public (see "The Feasibility of Electronic Voting in Canada," 2000).

There is a distinction between voting online and contributing in a more fundamental way to policy debate and decision-making. Tools for citizen interaction include online forums and chats, which help to create virtual communities. In this way, European cities have been successful in promoting civic networking: "The overall effect - in Bologna as well as in other European cities - has been widespread growth of technical education, a better dialogue between citizens and public administrations and often the feeling of belonging to a 'virtual community'" (Guidi et al., 2001; cf. Guidi, 2000; Frey, 2000).

"Local government is now equipped to consult with its citizenry in a continuous manner which has a high level of transparency and which will in time have consequences for perceptions of accountability" (Grieco, 2000: 1721).

Another tool for citizen engagement is online consultations. In-person consultation processes are quite expensive, and it is possible that the use of ICTs would make such processes more feasible. At the municipal level, there have already been several experiments with online consultations on budget and town planning issues. For example, the City of Indianapolis/Marion County utilizes a budget calculator as a unique way of conducting budget consultations. These "scenario planning

tools" go beyond allowing citizens to simply agree or disagree with proposed budget items by providing citizens with insight into the implications of the budget decisions (Agnew, 2001). Brent Council in the United Kingdom has been using the Internet as a tool to consult their citizens on the upcoming budgets since 1997. UK Citizens Online Democracy, a site set up to provide help with electronic democracy practices, was an important part of this process. This may point to the need for an intermediary to assist local authorities in their consultation processes.

On the town planning side, citizens can influence town/city planning through real time participation in planning discussion, or even through simple email communications:

> Before the local elections the city asked for citizens' initiatives by e-mail and on paper for the new city council. Conversations about the initiatives took place on the web, between citizens and candidates. Citizens voted about the initiatives...five suggestions won in the vote...and were taken into account in city planning and budget preparation (Seppälä, 2001; cf. Seppälä, 2000).

"One of the first things we did was post a survey about a proposed new Interpretive Centre and we expect the number of responses to be much higher than our former method of distributing a paper form to fill out and return via fax or by hand."

"I foresee a greatly expanded use of the site to provide information and to ensure citizen engagement for truly democratic local government."

– Survey Respondents

Geographic Information Systems (GIS) have also proven to be a useful tool to allow public participation (Carver et al., 2000). In the U.S., the Local Leaders for GIS Consortium (LLGIS) has formed to explore the usefulness of GIS for local jurisdictions ("Local Leaders Advocate GIS Through New Consortium," 2000).

Given that online citizen engagement is only beginning to emerge internationally, it is no surprise that western Canadian municipalities are not terribly advanced in this dimension. Like other aspects of western Canadian municipal websites, emerging democratic features are largely information-based. The current effort to establish government information on municipal websites will help to engage and inform citizens. Most of the websites encourage public feedback through online forms and/or email. Email contact is routinely provided on municipal websites in western Canada; citizens can email city councillors about local concerns and may be more comfortable participating at this level of government. However, as a communication mechanism, it is not clear that email is significantly different from more traditional forms of correspondence.

Very few western Canadian municipalities currently have online voting or surveys. Surveys are more popular; while only a small percentage of municipalities currently offer surveys, most plan to make surveys available within two years. It is worth noting that larger municipalities did not report having any of the other citizen engagement tools mentioned in our study. Only moderate-sized municipalities reported having any examples of online voting. In addition to general feedback

Figure 5:

Citizen Engagement Availability

	Large Municipalities (n=12)	Medium Municipalities (n=43)	Small Municipalities (n=97)
Surveys	25%	5%	2%
Citizen Forums	0%	5%	3%
Online Consultation	0%	5%	0%
Online Voting	0%	2%	0%
Videoconferencing/webcasting	0%	0%	0%

surveys, some municipal websites solicit participation regarding specific issues. For example, the Vancouver site has an online survey on the Greenways Program, which is developing a system of pedestrian and cyclist paths; the Victoria site recently had an online survey on a proposed multipurpose facility; and Winnipeg's site allows citizens to comment on diversity issues as part of the Mayor's Task Force on Diversity.

Discussion forums can help provide a sense of community and allow for greater depth of interaction. However, it is not clear how forums will be used as a policy tool.[2] Only a few smaller and moderate-sized western Canadian municipalities currently report having citizen forums/chats on their websites. However, one in five of all municipalities that were surveyed have plans to use this tool in the future. The environmental scan found that two municipalities – Calgary and Victoria – do have external discussion forums linked to the municipal website. Victoria's site links to CivicNet, which offers links to newsgroups and listservs discussing provincial and national politics as well as environmental and aboriginal issues. Calgary's site links to "Building Stronger Communities," an external website that provides information on "learning circles" that physically meet to discuss local issues, allows visitors to submit their views on a hypothetical scenario, and provides a contact number for those interested in the possibility of a "cyber learning experience."

It should also be noted that the Mayor of Calgary recently launched a new website (www.whatcalgarycanbe.org) to give Calgarians a chance to "give their opinions on what the city can do better" (Heyman, 2001:B7). This website, which is not currently linked to the City's website, is still mainly information-based, but there are links to key community organizations in Calgary and to citizen involvement efforts in other Canadian cities. Information is organized by topic and citizens are invited to submit comments by email. There is not currently a forum or a citizen chat on the site.

"The website is a very powerful communications tool. In today's local government environment where public involvement and consultation is expected and demanded if absent, the website can be a very cost-effective tool to address this."

– Survey Respondent

2. The Espoo Youth Council uses the "IdeaFactory" to debate ideas which are then submitted to local decision makers (Frey, 2000: 12). Online forums for political discussions are still in the early stages of development. In order to be successful, online forums will need "continuous user involvement" (Ranerup, 2000: 221).

VI. Potential Problems and Barriers

E-government poses a number of challenges, ranging from issues of privacy to the large costs associated with establishing and maintaining an effective website. These are not issues peculiar to municipal governments; all governments must address these questions and concerns. Municipalities, however, have much more limited fiscal and personnel resources to draw upon to resolve the challenges.

Access

Accessibility remains a key issue in e-government. While the Internet is increasingly familiar for many citizens, others are not able to afford computers and do not have opportunity to use them. Research demonstrates that the "digital divide," as it is known, does in fact exist: ethnicity, class and education all influence availability of Internet access ("Haves and have-nots," 2000). Several program initiatives are seeking to improve accessibility. For example, the Calgary Community-Net provides terminals at four different locations and operates on charitable donations. There are many other examples of freenets in Canada and abroad. However, it should be noted that freenets face financial barriers with respect to upgrading technology (Henry and Vander Ploeg, 1997: 6). Another program is Industry Canada's Connecting Canadians initiative, which seeks to provide all Canadians with access to the Internet (Binder, 2000: 7). The initiative includes a national Community Access Program (CAP) to work with non-profit organizations to develop a national network of up to 10,000 public access sites by March 2001 ("Community Access Program Announces Results of First Urban Competition," 2000). The Ottawa CAP Consortium, for example, is a partnership among schools, municipal offices, libraries and other community locations whose mission is "to ensure co-ordination of an ongoing city-wide strategy, enabling all citizens of Ottawa to participate and have public access via the Internet to a Suite of E-Services."

"By giving every citizen a digital signature and maintaining the highest standards of data and privacy protection in its electronic transactions, e-governments will not only increase confidence in the Internet delivery of their own services, but will also provide a stimulus to e-commerce throughout the economy." ("Handle With Care," 2000)

Accessibility also relates to gaps in communications infrastructure, and improvement of infrastructure is considered to be the cornerstone of the emerging digital economy (Whittaker, 2001). An example of this attention to infrastructure is Alberta's SuperNet project, which is focused on improving high-speed access to the web for communities throughout the province.

Accessibility issues did not appear to concern the western Canadian municipalities greatly: only 5% of municipalities surveyed currently have public kiosks, and only one in ten have plans to have kiosks for public use in the future. However, many municipalities have computers available in schools or libraries for public use and may not see a need to provide other free access points for citizens.

Privacy and Collection of Personal Data

Public concerns about privacy are becoming less prominent than they have been in the past. Research shows that Canadians are becoming more comfortable with exchanging personal information for benefits such as easily accessible information ("Privacy Commissioner Report," 2000). This trade-off between privacy and the collection of personal data is especially relevant in the context of municipal e-government. Don Lenihan, of the Centre for Collaborative Government, suggests that the most promising aspect of e-government will be its potential as a data collection tool. These techniques can be used to identify trends that might help provide a wider range of online services and opportunities for citizen engagement. Lenihan emphasized that, compared to other levels of government, municipalities have the potential to make "rapid and substantive progress" in this area. As smaller governments, they can more easily "define fifteen to twenty outcomes and track progress . . . if this is a hidden driver, municipalities will make quicker progress" (Lenihan, 2001).

Canadian federal legislation is beginning to address some of the privacy issues raised by ICTs. The Personal Information Protection and Electronic Documents Act is being implemented in three stages and should be fully functional in January 2004, the same time that the federal electronic government is slated to be fully operational (Foran, 2001). Personal information includes name, race, DNA code, religion, and phone number. The Act helps to determine when personal information can be disseminated and be collected. The Act demands transparency: citizens will have the right and means to look at information that is being collected about them.

The federal Communication Security Establishment has said, "without security, the value of the information highway is significantly reduced" ("Why do we need the Government of Canada PKI?", 2000).

Security

Traditionally, governments place more emphasis than the private sector on issues of security and trust ("The Next Revolution," 2000). It is widely agreed that security devices and systems will have to be implemented if e-government is to reach its full potential. Only 3% of the western Canadian municipalities surveyed currently enable the public to use personal identification numbers (PINs) for privacy and security; 17% have plans to do so in the future. These rates will necessarily increase as e-services develop.

Three models of online security are currently prominent: public key infrastructure (PKI), digital signatures, and smart cards. PKI is designed to enable financial transactions and other exchanges of information to take place in a secure fashion, and has been adopted by Sweden, Norway and the Netherlands (Heath, 2000). San Jose, California is the first city in the United States to offer online services with the protection of a digital signature ("San Jose First City," 2000), and software for encryption and digital signatures is being implemented in Quebec. One of Canada's smart communities, Nova Scotia's Western Valley Development Authority, is exploring the use of smart cards for security purposes.

Costs

E-government -- and in particular, e-services – is a high-cost venture; while many argue that e-services will save money in the long-run, the costs of implementing and maintaining effective services can be considerable. In addition, it is difficult for a government to simply create e-services and shut down other traditional service options, and governments can be caught in long transition periods supporting multiple service provision options (for example, electronic, telephone, mail and in-person service delivery).

High start-up costs have been cited by several recent initiatives. For example, the Canadian federal initiative is expected to cost up to $5 billion. Infrastructure and technology will require $180 million on its own (O'Brien 2001). The City of Calgary recently stated that it would cost the City $15 million to implement their e-government plan (Wilton, 2001). It was estimated that a website able to service 50 cities across North America would initially cost $U.S. 30 million (Tam, 1999). The cost issue motivates collaboration between industry and cities in U.S. e-government programs ("National League of Cities," 2000).

"Action really is at the municipal level because that is where the direct citizen contact is."

– Janet Caldow, Director of the Institute for Electronic Government

VII. Future of ICTs and Municipal Governments

Western Canadian municipal websites have a significant amount of e-government development ahead of them. It was recognized early on that local government can be an effective innovator in using ICTs: "local government must innovate and encourage deliberation of public issues via the Internet to improve public deliberation at the local level and advance Internet use to the next level" (Bent, 1996-7). Nevertheless, this imperative speaks more to potential than it does to the current reality. How e-government will develop in the years ahead is unclear; as DavidDe Rosa from Civiclife.com emphasized, e-government will be shaped by "whoever pioneers" the model (DeRosa, 2001).

Polling research suggests that the public would like a single website to encompass a wide range of government services, regardless of which level of government is responsible (PricewaterhouseCoopers, 2000: 37; cf. O'Brien, 2001; Downey, 2000). While such a cross-jurisdictional model would be more convenient for citizens, governments would need to expend great effort to coordinate their services – a time-consuming and potentially costly task. Canadian governments have yet to create such multi-jurisdictional websites, but it should be noted that CivicInfo, the Union of B.C. Municipalities and the B.C. Ministry of Municipal Affairs hired MacDonald Dettwiler and Associates to construct "'one-window' Internet access to municipal government services throughout British Columbia" (Boei, 2000). It is possible that the one-stop-shop model could win out for delivering e-services, perhaps working with the emerging "life episodes" model (organizing services from birth to retirement).

Is greater availability of online citizen engagement likely in the future? According to David Agnew of Digital4sight, a company researching ways to use new technologies for citizen engagement, citizens still "don't necessarily believe that they have a role" (Agnew, 2001). The extent of demand for these features of e-government will be a crucial factor. Janet Caldow of IBM's Institute for Electronic Government suggests that interest in citizen engagement tools will need to come from governments, not citizens (Caldow, 2001b). It is interesting to note that Civiclife.com, a company using the one-stop-shop model at the community level, focuses exclusively on service delivery simply because "at the moment there is not much appetite for citizen engagement" (DeRosa, 2001).

Municipal governments appear poised to play an important role in the e-government revolution. Jari Seppälä, Information Manager for the City of Tampere, Finland, says that local government is "the best candidate because, compared to other jurisdictions and institutions, it has the power in local issues" (Seppälä, 2001). This can extend to making services and engagement tools more accessible to the public through public kiosks and other public portals. Another factor that may contribute to the possible success of e-municipalities is their apparent community-building function. This reinforces the idea that municipal government websites may have the advantage of local appeal.

The role of government officials in policy-making processes is bound to change as e-government becomes more firmly established.

The role of government officials in policy-making processes is bound to change as e-government becomes more firmly established. As Don Lenihan points out, in addition to the departmental barriers in government becoming blurred, the development of citizen engagement processes could fundamentally alter the traditional role of elected representatives (Lenihan, 2001; cf. Alcock and Lenihan, 2001).

VIII. Recommendations

There are a number of ways in which municipal e-government could be made more effective for both citizens and governments:

1. Municipal websites should have a clear purpose.

A key weakness of municipal websites, taken as a whole, is the haphazard provision and patchy organization of information. This appears to be the result of undefined goals for the website. There has been considerable pressure on governments (as well as businesses) to establish an online presence, and it appears that in the rush to do so, many have been unable to step back and define clearly why the website exists. Without this internal direction, there is a tendency for municipalities to simply throw large amounts of information onto the site, with no means to evaluate the costs and benefits of doing so. The end result is incomplete information in key areas, an abundance of less

useful information, and poor organization. In addition, because the website is not specifically tied to a particular end, there is often unclear responsibility for constructing and maintaining the site.

Municipal governments should make a firm decision about the present purpose of their websites, and use this as a standard for organizing and building the sites. This purpose should relate not only to government needs, but also to citizen demand. The responsibility for the maintenance of the site should be related to the site's purpose, and evaluation mechanisms should be developed.

2. Municipal websites should be organized in a manner that makes sense to citizens.

The website design should reflect the needs of users, rather than a government's organizational structure or the format of communication. For example, some sites lump together all services, or all e-services, rather than organizing the sites according to topic. The "cradle-to-grave" model, although typically limited to services, is one example that appears to have had some success; one advantage of this is that it allows for natural linkages to senior government websites (discussed in the next recommendation).

Citizen feedback is particularly important to creating a user-friendly site.

Another example of user-friendly organization is the City of Seattle site, which categorizes information under "living in Seattle" (e.g., community resources, utilities, emergency services, government), "doing business" (e.g., planning, permits, development) and "visiting Seattle" (e.g., tourism, recreation, demographics).

These are but two examples, and there are many other ways in which a user-friendly government website could be organized. Citizen feedback is particularly important to creating a user-friendly site. Governments could more actively solicit input about what features would enhance the site for users through surveys or focus groups.

Beyond the organization of information, government sites could become more user-friendly by including effective site search engines, frequently asked question sections (FAQs) within each topic, and departmental/employee contact directories.

3. Municipal websites should make clear which level of government is responsible for particular services or information, and provide links to senior governments when relevant.

Citizens do not think in jurisdictional terms; many citizens are unclear as to which level of government provides health care, fixes potholes, or handles immigration processes. Municipal government websites should address potential confusion by providing links to provincial and federal governments, as well as school boards and health districts. Ideally, these links would be organized

topically – for example, a citizen looking on the City of Calgary website for health care information would be provided a direct link to the Calgary Regional Health Authority site, and a citizen looking on the City of Winnipeg site for immigration information would be provided a direct link to the Citizenship and Immigration Canada site.

4. Municipalities should ensure existing components are effectively developed before adding features and e-services.

This is basic "walk before you run" advice, but appears necessary. Some municipal sites have or are planning to develop e-services, despite the fact that their present information is incomplete, difficult to access, and/or poorly organized. In the rush to take advantage of technological opportunities, the ultimate purpose of the municipal website can be lost. For this reason, it is recommended that municipal websites first improve upon the information aspects of their websites – Is it organized effectively? Does the information presented match citizen demand? Is the site user-friendly? – before embarking on e-services or online citizen engagement.

5. When developing e-services, municipalities should work together to seek out economies of scale.

E-services are expensive to develop, and the costs may be prohibitive for a single municipality. However, it is possible that municipalities could work together to find economies of scale in implementing e-services. In addition to software, municipalities could share experiences. Municipalities could also band together to utilize the one-stop model.

In the rush to take advantage of technological opportunities, the ultimate purpose of the municipal website can be lost.

6. When developing "one-stop" government websites, senior governments should ensure municipalities are equal partners in discussions and planning.

There is considerable interest in and pressure for "one-stop" government websites, where citizens can renew their library books, pay their income tax and apply for a provincial parks permit. If and when planning begins on these sites, municipal governments should be included as equal partners in the discussions. Due to the number of municipal governments in a province, it may be the case that a select number – for example, the large cities plus the provincial municipal association – will need to represent the municipalities. While the mechanism for municipal involvement is unclear, it seems only appropriate that "one-stop" e-government efforts include the municipalities in the early planning stages.

IX. Conclusion

E-government is, in part, a product of new technologies. However, it is also largely defined by new partnerships and collaborations between citizens, government and industry. The knowledge society may produce a new citizen who is more at ease with continuous learning and has the ability to access information. Virtual communities are an important and emerging product of the Internet age and can play an important role in municipal e-government.

There are several reasons to believe that municipal government may be a good candidate for developing e-government. Citizens already make more transactions with municipal governments than with other levels of government. Citizens are also accustomed to making transactions with local government rather than with private intermediaries. Citizens are in a better position to participate in local issues, and are more likely to trust and feel connected to this level of government.[3] The challenge ahead is to develop effective e-government websites that meet the needs of the municipalities and their residents.

3. A recent study on citizen expectations for e-government found that people are most likely to establish a sense of connection to their own local government (see Intergovernmental Advisory Board et al., 2000: 7).

Appendix: Canada's Smart Communities

Industry Canada's Smart Communities initiative has funded the development of several model regional websites. This initiative emphasizes the delivery of government services, with attention to other areas such as the arts, culture, library, business, and lifelong learning. Smart Communities are an exercise in developing unique ways that communities, businesses, citizens and governments can benefit from new technology developments. This ambitious call to action is costing the Government of Canada $60 million over a three-year period (Gurman and McKeough, 2000). Through a competitive process, 12 communities were selected to receive $5 million in funding over a three-year period. A Smart Community was chosen from each province, one Northern community, and an Aboriginal community, for a total of 12 Smart Communities.

The Smart Communities' websites demonstrate several innovative features. The Yellowknife site is a model of e-government providing e-services and information (Shoesmith, 2000: 26). Kuh-ke-nah Network, the Aboriginal site, emphasizes links to communities, health information, and distance education for high school students. Some of the Smart Communities, such as the Calgary Research and Development Authority's Infoport and Nova Scotia's Western Valley Smart Community, are focused on developing technology to help improve community access.

Smart Capital, the showcase site for the Ottawa Centre for Research and Innovation (OCRI), another Smart Community, demonstrates pages for both electronic transactions and electronic democracy. Smart Capital will be the site for the Ottawa-Carleton region, and promises to be quite innovative. There has already been some activity: the public was encouraged to view and give feedback on live webcasts about the reconstruction of Hawthorne and Conroy roads (Wilker, 2001).

The Alberta government's recent "Let's Get Wired" project also helped develop e-government. This may be one of the reasons that municipalities in Alberta have been so successful going online. The University of Alberta and Alberta Municipal Affairs were partners in the nearly $2 million project. In addition to providing practical support, the project developed its own site, MuniMall.net, and engaged in research that would be useful to municipalities in Alberta. The project has helped to boost Internet use amongst municipalities by over 30% (Marles, 2001).

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